

EXHIBIT 1

UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

SCANSOFT, INC.,)
Plaintiff,)
v.)
VOICE SIGNAL)
TECHNOLOGIES, INC.,)
LAURENCE S. GILLICK,)
ROBERT S. ROTH,)
JONATHAN P. YAMRON,)
and MANFRED G. GRABHERR,)
Defendants.)
)
C.A. No. 04-10353-PBS
BROMBERG & SUNSTEIN
PRESUMED CONFIDENTIAL UNTIL 2/21/2010
PURSUANT TO PROTECTIVE ORDER

DEPOSITION OF PETER J. FOSTER, a witness called by and on behalf of the Defendants, taken pursuant to the applicable provisions of the Federal Rules of Civil Procedure, before Dana Ulrich Welch, CSR, Registered Professional Reporter, and Notary Public, in and for the Commonwealth of Massachusetts, at the offices of Choate, Hall & Stewart, 53 State Street, Boston, Massachusetts, commencing at 10:13 a.m.

Job No.: 2196

COPY

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1 A. Voice dialing. There is -- I mean, it's --
2 there's speech recognition connected to it. I mean,
3 it's not just limited just to voice dialing, but
4 voice dialing in a broad sense.

5 Q. Okay. And as of the date that the first of
6 these patents was filed, which is April 13th, 1992,
7 what was the novel aspect of the invention that the
8 three of you had come up with?

9 MR. ASHER: Objection.

10 THE DEPONENT: Am I --

11 BY MS. COLUMBIA:

12 Q. You're permitted to answer unless your
13 counsel instructs you not to answer, sir.

14 A. All right. I mean, there were many. No
15 one had ever done -- had successfully developed a
16 way to do voice dialing in wireless environments
17 before.

18 So I mean, I truly don't remember them all.
19 I believe they're in the patents, embodied in the
20 patents. But suffice it to say, no one had ever
21 successfully invented a way to basically safely dial
22 your car phone.

23 Q. And what was the way that you and Dr.
24 Schalk and Mr. Bareis invented?

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1 A. When you say the way, do you mean like the
2 method that we used to invent it or --

3 Q. No. I'm sorry. You just commented that no
4 one had figured out a way to safely dial your phone.
5 And as I understand it, the three of you did figure
6 out a way to safely dial your phone?

7 A. Right.

8 Q. What is it that you figured out; what is
9 that way?

10 A. Again, there isn't an it; there's many
11 things. The first -- we came up with a way so that
12 people could and would dial their telephone using,
13 you know, using their voice as opposed to their
14 hands or anything else.

15 Q. Uh-huh.

16 A. And it's a great number of pieces to it
17 that are, you know, I mean, I go through some of
18 these things. It's -- but there's different
19 elements of it that make it successful. And
20 there's, let's say, I'd call them subinventions that
21 are all part of it, part of the total invention of
22 how you do the voice dialing.

23 Q. Okay.

24 A. Examples or counter-examples would be when

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1 you dial a regular telephone, you know, you look at
2 it; you pick up the receiver or the hand piece; you
3 look at the buttons; you push them and those kinds
4 of things.

5 Well, up to this point in time, no one had
6 been able to do that in a wireless environment
7 without, you know, without sort of the traditional,
8 manual way to dial. And so we came up with a
9 system, and I'm not trying to be technical in terms
10 of method apparatus application. But I called it an
11 application that would pull together aspects of the
12 recognition, the way people behave with it, aspects
13 of voice feedback, speech synthesis, whether it was
14 real or not, meaning machine generated or actual
15 compressed speech, and other sub -- I'll call them
16 sub-routines, because most of this was software
17 based -- some of it was hardware, but most of it was
18 software, that people would actually interact with
19 successfully.

20 So I mean, there's a lot of little aspects
21 that went into it. But it was basically the first
22 time -- not basically -- it was the first time, and
23 surprised a lot of people that you could make
24 speech, a speech system that would work for voice

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1 dialing in a wireless environment.

2 Q. What was your contribution to the overall
3 invention, understanding that it had many
4 subinventions to it.

5 A. I don't remember the whole -- I'm sure
6 there's various aspects of it. But remembering that
7 this was, you know, 13, 15 years ago. Starting with
8 let's go after this market. Determining the
9 requirements, you know, in advance of the invention.
10 In other words, what are you trying to do. A lot of
11 the human factors; a lot of the telecommunications
12 strategy and overall systems design; the testing,
13 some of the testing for it; what are the -- maybe
14 that's requirements. But you know, when is it
15 successful; when is it not successful.

16 Boy, just little bits and pieces. Things
17 as simple as timers; where does one set timers. I
18 had a lot of experience in telecommunications and so
19 brought that expertise to the situation, a lot of
20 experience with phones and switching systems.

21 So I mean, the three of us were, it wasn't
22 you just do this and you just do this and me just do
23 that. I mean, we had primaries. Tom, Dr. Schalk
24 was primarily responsible for the speech

1 recognition, but he also contributed heavily and in
2 some cases lead to the -- lead contributor to the
3 human factors. Mr. Bareis also had switching
4 experience from a previous career and
5 telecommunications experience and he was primarily
6 in the hardware development.

7 But we would meet and collaborate on -- on,
8 you know, as a committee on most -- on where these
9 things came together. And actually, critiqued is
10 probably too strong a word, but looked for holes in
11 the areas where someone else had the prime
12 responsibility. So it was a pretty good
13 collaboration.

14 Q. Okay. When did Mr. Bareis join the
15 company?

16 A. I don't remember.

17 Q. I may have asked you that.

18 A. After me.

19 Q. Sorry.

20 A. Yeah.

21 Q. When approximately did the three of you
22 begin this collaborative process which resulted in
23 the invention that's described in this family of
24 patents?

1 A. I don't really remember.

2 Q. Do you remember if I -- the first patent
3 application was filed in April of 1992. Can you
4 tell me, we started two years before that, five
5 years before that? I assume it's a number of years
6 to develop this technology, but I may be wrong.

7 A. Yeah, this invention -- let me answer it
8 this way: We got together with patent counsel and
9 learned about patents because none of us were
10 experts in it. And had to go through, jump through
11 some steps with the patent attorney to determine
12 what inventions were not accomplished prior or, you
13 know, too early in the process. I don't even
14 remember how long that was. I think it was a year.
15 I might be wrong.

16 But we went through things like we had to
17 produce marketing documents to show him of all our
18 products and -- maybe not all of them, but anything
19 relevant, you know, so that we could sort of bound
20 this and determine where we could start with the
21 invention.

22 It was my opinion we had patentable
23 technology of other ilks, other inventions, let's
24 say, that we chose not to patent earlier. So

1 there's this continuum of what we're doing.

2 But it centers around the inventions that
3 we made that went into the McCaw cellular voice
4 dialing system; that was the trigger that caused us
5 to say, well, this stuff is now getting out. That
6 was a commercial product, you know, something that
7 the average person I think would think is
8 commercial. We sold it. They put it into general
9 use among their wireless customers in Dallas, Texas.

10 Q. Okay.

11 A. So we, you know, we thought we'd patent it.
12 We went back and looked at any number of inventions
13 that we had, figured out the ones that were possible
14 or let's say, the aspects of this that were possible
15 to protect with patent, with a patent law and dealt
16 with those in these patents. And the core of it is,
17 you know, voice dialing in this wireless
18 environment.

19 Q. Okay. And the patent counsel that you
20 referred to, was that Mr. Judson at the time?

21 A. David Judson, yes.

22 Q. Putting aside -- we'll get back to the
23 materials you've collected up for your patent
24 counsel. So putting those aside and focusing

1 A. Our strategy was to focus on patenting
2 applications of speech rather than algorithms.

3 Q. Okay. And what do you mean when you talk
4 about patenting applications of speech as the
5 strategy? And if it will help you, you can give me
6 a concrete example.

7 A. Well, this is a good one, voice dialing 183
8 family. There's a lot of technology and invention
9 that goes into a speech recognition success, rather
10 than just the algorithm. And I felt the industry
11 was too focused on which algorithms were better by
12 two and a half percent. The error rates were
13 generally two percent, so if you were two percent
14 better on two percent.

15 On the other hand, you can greatly improve,
16 make something workable if you can deal with other
17 causes of errors besides just core speech
18 recognition. So it's that stuff that I told our
19 folks was valuable. Not to mention the speech
20 recognition algorithms, yeah, yeah, yeah. But our
21 real crown jewels was how to make it work; said
22 differently, the surround around the recognizer that
23 made people, I mean, ultimately it came to down to
24 an error rate, so you could express it to the

1 technologists in terms of an error rate.

2 If you could do something outside of the
3 speech recognizer that would make the speech
4 recognizer look like it worked better, it worked
5 better, I mean, in application. And it didn't show
6 itself in an algorithm test.

7 So I was trying to capitalize on that work
8 and effort and invention that went into everything
9 else, too, not just the algorithm.

10 Q. Okay. And applying what you just described
11 as the application to the development of voice
12 dialing at the central switch for cellular service
13 providers, what were the extra challenges faced by
14 moving it, not moving it, but by instead of putting
15 it in the handset, putting the voice dialer at the
16 cellular providers switch?

17 MR. ASHER: Objection.

18 THE DEPONENT: I mean, there were some
19 aspects that were switch-based related and there
20 were some aspects that were application based
21 related. And when I say application, let me
22 back it up. Like collecting digits. That is an
23 application, sort of a sub-application or -- and
24 you have to learn how to collect digits in a

1 user's desire to use them in a certain way.

2 For example, you can collect credit card
3 digits in one way. If you're collecting a
4 telephone number, you can do it another way.

5 And it's -- this is where what I was describing
6 as the application really comes into play. In a
7 credit card number, there's a check sum. And so
8 if you use the intelligence that's outside of
9 the recognizer or if you use this check sum
10 information, you can greatly improve the
11 recognition, apparent recognition accuracy.

12 BY MS. COLUMBIA:

13 Q. Yeah.

14 A. So in this case, we put a lot of effort and
15 a lot of brain power into how do people in a mobile
16 environment, wireless, handset, you know, how do
17 people interface with the recognizer to make the
18 recognizer work better.

19 Q. Okay.

20 A. A simple example for a nonmobile phone like
21 look at that one, it's a Nortel or a Meridian phone,
22 I think.

23 Q. Meridian, yeah.

24 A. It has a display. Well, you're sitting

1 there and you can look at the display for feedback
2 about whether the darn thing knows, in a speech
3 case, whether it's recognizing what you've said to
4 it. You can't do that in a car. I mean, you could,
5 but God help us all.

6 So you know, it's really different how you
7 do dialing in a mobile environment rather than a
8 static environment. And we -- no one knew how to do
9 that --

10 Q. Okay.

11 A. -- at the time. And that's what I was
12 trying to get across to our guys. You know, the
13 scientists all blew that off as that's the easy
14 stuff. The hard stuff is this mathematical. And I
15 used to tell them, you know what, the algorithm is
16 two percent of the product; so get over yourself.
17 That's a quote that they've heard many times. So
18 that's what I mean by the application. It's all
19 this other stuff.

20 Q. So I guess the question that I was asking
21 but I didn't ask very well was before you first
22 approached McCaw, as I understand the chronology we
23 did this morning, understanding we don't have very
24 good date stamps, but you had built a voice dialer

1 that was attached or inside the NEC phone. You had
2 built a voice dialer for the Italtel phone and for
3 the Uniden phone.

4 What were the application challenges
5 specific to moving, I don't want to say moving
6 because that's probably wrong, but to having the
7 voice dialer at the central switch as opposed to in
8 the handset, which you had done to date?

9 MR. ASHER: Objection.

10 BY MS. COLUMBIA:

11 Q. Well, let me ask, were there challenges
12 associated with voice dialing application at the
13 central switch that were not present in the voice
14 dialing application in the handset or in the
15 cellular phone?

16 A. I'd express it in a different way.

17 Q. Okay.

18 A. There was more to do and more you could do
19 and that's the key.

20 Q. Okay.

21 A. You didn't see tens of thousands of these
22 NEC phones running around. And they didn't meet the
23 fundamental problem. They were a nice algorithm
24 implementation and the application was terrible.

1 People didn't use them. Because of the ability to
2 put it centrally, as opposed to having to replicate
3 the hardware everywhere, you were afforded a cost
4 savings per user that you couldn't even begin to
5 approach in a phone.

6 So we had failed at -- I mean, you know,
7 the thing recognizes digits, big deal. Nobody used
8 it. It was a pain in the rear end. The only people
9 who used it was somebody trying to impress somebody.
10 It wasn't safer because people didn't use it.

11 Once we got into being able to make it a
12 piece of the switch or of the network, you could
13 spend lots of money on hardware because it got
14 distributed across tens of thousands of customers.
15 So we were able to now really develop something
16 people could use from a cost perspective, which then
17 led to the challenges. Okay?

18 Q. Okay.

19 A. Things like, how did you deal -- how do you
20 effectively deal with noise. And I don't mean
21 steady state noise. I mean, somebody tooting the
22 horn, PJ in the back seat saying, dad, in the middle
23 of me trying to talk to the thing, windshield wipers
24 being turned on, the radio going a little too loud;

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1 I mean that's just one class of things.

2 Another class of things are the timeouts.

3 You couldn't have the -- most people in those days
4 were trying to do speech recognition with a digital
5 signal processor, which is an expensive class of
6 computer, very expensive, even more expensive in
7 terms of its memory system. We had to deal with, I
8 think it was an Intel 8088 -- which was basically a
9 piece, an early, very early PC chip kind of thing --
10 because of the cost.

11 I mean, even then, phones were being given
12 away. People wouldn't spend any more for a
13 peripheral to a phone, even to save their lives,
14 until afterwards. I mean, it's just like today.
15 You go sign up for cellular service, you get a phone
16 for free or something like that. And these things
17 were coming in at \$300 retail. You know, that was
18 insane. So nobody -- didn't take off. It was a
19 failure as a commercial product. And as a speech
20 recognizer.

21 You didn't tell people this, but that's
22 what it was. So with -- we could used whatever
23 computer, we could have used a Cray if we wanted to
24 at the central office because the cost was

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1 distributed across thousands of people.

2 So then that let us do things like
3 nonstatic timing. And what I mean by that is we had
4 to learn things about how people spoke digits in a
5 digit string and build intelligence around the
6 recognizer to interface with people -- you know,
7 it's a man machine interface -- which nobody knew
8 about, nobody had done.

9 We went out and finally bought a book about
10 how to interface it to -- how to interface this
11 intelligent peripheral to other parts, other
12 systems. And they had sort of Bell standards for
13 land lines and then we had to adapt those to the
14 wireless environment. There's timeout -- and
15 timeouts are a big one, believe it or not, for
16 regular phones. How long you can sit there and not
17 dial anything and the dial tone either stays there
18 or it goes away.

19 Well, it's like, I don't know what it is,
20 30 seconds. Well, you can't have an open microphone
21 for a speak recognizer for 30 seconds in a car;
22 sooner or later, the thing is going to think it
23 heard something, a bump in the road. And especially
24 then, when the technology was very fragile.

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1 CERTIFICATE

2

COMMONWEALTH OF MASSACHUSETTS

3 SUFFOLK, SS

4 I, Dana Ulrich Welch, Registered Professional
5 Reporter and Notary Public in and for the
6 Commonwealth of Massachusetts, do hereby certify:

7 That PETER J. FOSTER, the witness whose
8 deposition is hereinbefore set forth, was duly sworn
9 by me and that such deposition is a true record of
10 my stenotype notes taken in the foregoing matter, to
11 the best of my knowledge, skill and ability.

12 IN WITNESS WHEREOF, I have hereunto set my
13 hand this 28th day of January, 2005.

14

15

DANA ULRICH WELCH

16 Dana Ulrich Welch, RPR
17 Registered Professional Reporter

18

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EXHIBIT 2

UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

SCANSOFT, INC.,)
Plaintiff,) PRESUMED CONFIDENTIAL UNTIL 2/18/05
v.) PURSUANT TO PROTECTIVE ORDER
VOICE SIGNAL)
TECHNOLOGIES, INC.,)
LAURENCE S. GILLICK,)
ROBERT S. ROTH,)
JONATHAN P. YAMRON,)
and MANFRED G. GRABHERR,)
Defendants.)

)

RECEIVED
FEB 03 2005
BROMBERG & SUNSTEIN

DEPOSITION OF THOMAS B. SCHALK, a witness
called by and on behalf of the Defendants, taken
pursuant to the applicable provisions of the Federal
Rules of Civil Procedure, before Dana Ulrich Welch,
CSR, Registered Professional Reporter, and Notary
Public, in and for the Commonwealth of Massachusetts,
at the offices of Choate, Hall & Stewart, 53 State
Street, Boston, Massachusetts, on January 28, 2005,
commencing at 9:18 a.m.

Job No.: 2197

COPY

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1 claim, is it correct that the Uniden phone
2 utilized a speech recognition method for a
3 mobile telecommunications system?

4 MR. SCHECTER: Objection.

5 THE DEPONENT: Can you repeat that?

6 I'm trying to get the question.

7 BY MR. FRANK:

8 Q. Sure. Is it correct that the method
9 incorporated in the Uniden system was a speech
10 recognition method for a mobile
11 telecommunications system?

12 MR. SCHECTER: Objection.

13 THE DEPONENT: Not a mobile
14 communications system. It was an interface
15 to the phone, to the dialing process of the
16 phone.

17 BY MR. FRANK:

18 Q. What's the distinction that you're
19 making?

20 A. Well, the phone, and like a destination
21 that you're calling, I mean, that's all part of
22 the telecommunications system. But this is an
23 interface to the dialer, in the case of the
24 Uniden phone.

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1 best understanding; that's all I can ask for.

2 A. But if you use different ways of
3 wording things, I can answer the questions
4 better.

5 Q. Unfortunately, I'm constrained by some
6 legal requirements to ask you some of these
7 questions this way.

8 A. And I'm not someone who is in a
9 position from a legal standpoint to interpret
10 some of the language.

11 Q. I'm asking from your perspective, both
12 as the inventor of this patent and as somebody
13 who's in the business. And I'm simply asking
14 for your understanding.

15 A. Okay. And I'm going to have to answer
16 the questions using terms I am comfortable with
17 and hoping that they match what you're
18 thinking.

19 Q. Okay. So let me ask whether a method
20 employed in the Uniden product, as described in
21 Schalk Exhibit 4, was a speech recognition
22 method for a mobile communications system?

23 A. The method employed in the Uniden
24 phone? Method, I'm not sure if you're talking

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1 about the method of speech recognition, the
2 method associated with the logic of the call
3 flows.

4 Q. The method of speech recognition.

5 A. The method of speech recognition is
6 different in the Uniden phone than in a system
7 -- it's not necessarily the same.

8 Q. And is it correct that the method, the
9 speech recognition method used in the Uniden
10 phone is, in your opinion, not a speech
11 recognition method for a mobile
12 telecommunications system?

13 MR. SCHECTER: Objection.

14 THE DEPONENT: In a general sense -- it
15 depends on how you define it. The speech
16 recognizer in the Uniden phone is designed
17 to recognize speech going through the
18 handset, the audio as its received.

19 You may have situations where you're
20 speaking into a handset where the audio is
21 transmitted to an off-board recognizer, the
22 recognition would be different, details of
23 the algorithm and such.

24 BY MR. FRANK:

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1 intelligence and all that stuff that the user
2 experiences is influenced by the black box.

3 Q. And what's being described here is a
4 black box that is hooked up in one way or
5 another directly to the central switch?

6 MR. SCHECTER: Objection.

7 THE DEPONENT: Well, I think -- unless
8 -- I think this patent is more about
9 general characteristics in voice activated
10 dialing. It goes into the some of the
11 components of voice activated dialing,
12 whether it's in the switch or not.

13 BY MR. FRANK:

14 Q. Well, we'll take it one at a time.

15 A. Okay.

16 Q. The patent describes a system that is
17 part speaker-dependent and part
18 speaker-independent; is that correct?

19 A. I don't know if that's covered in this.

20 I mean, you'd have to point to -- I say that
21 because we started with a speaker-independent
22 system and --

23 Q. Let me come at this differently. Did
24 there come a time when Voice Signal decided

1 speaker-independent voice recognition system?

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2 MR. SCHECTER: Objection.

3 THE DEPONENT: Actually, in my opinion
4 the algorithms that came about, that were
5 developed, could also be used on a system
6 that was not an off-board application. The
7 memory requirements turned out to be very,
8 very small.

9 BY MR. FRANK:

10 Q. So it's your opinion that it was the
11 algorithms developed by your group that made it
12 feasible to have the combined system?

13 MR. SCHECTER: Objection.

14 Mischaracterizes.

15 BY MR. FRANK:

16 Q. I'm not trying to mischaracterize.
17 Correct me if I'm wrong.

18 A. We developed a way to extend our
19 speaker-independent algorithm to operate in a
20 speaker-dependent mode. The memory
21 requirements to represent what we refer to as a
22 template or a representation of something that
23 someone speaks, like a name, the memory
24 requirements for that were so small, the RAM

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1 requirements for an on-board solution, that it
2 was practical to implement that on an on-board,
3 meaning embedded, or off-board.

4 Q. And do you find that algorithm or that
5 -- do you find that algorithm or that
6 development -- withdrawn.

7 MR FRANK: Would you read the last
8 answer to me so I ask the question in the
9 terms that the last answer was articulated.

10 (The testimony referred to was read by
11 the stenographer.)

12 BY MR. FRANK:

13 Q. And is that the method that you said
14 earlier was maintained as a secret at Voice
15 Control Systems?

16 A. Details were never disclosed. But some
17 of the manipulation of the speaker-dependent
18 representations, how you'd manipulate that and
19 do the averaging, was shared with Brite, for
20 example. But how the actual numeric
21 representations were generated, how you got
22 that, was never revealed.

23 Q. And there's nothing in this patent, the
24 966 patent, that describes the method that you

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1

C E R T I F I C A T E

2

I, THOMAS B. SCHALK, do hereby certify
3 that I have read the foregoing transcript of my
4 testimony, given on January 28, 2005, and I
5 further certify that said transcript is a true
6 and accurate record of said testimony (with the
7 exception of the corrections listed below):

8

Page Line Correction

9

10

NONE TBS

11

12

13

14

Dated at April, this 20th
15 day of _____, 2005.

16

17

Thomas Schalk

THOMAS B. SCHALK

18

19

SIGNED UNDER THE PAINS AND PENALTIES OF PERJURY

20

21

duw

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23

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